brains is scientific (because the literature of that subject is so), but the study of mental processes is popular, or non-scientific, for the reason that we have a mass of trivial literature on psychology.

T. D. A. C.

Notes on Fishes. — In a recent visit to San Diego the writer saw in the possession of an animal artist, Miss Annie Andrews, good paintings of the threadfin, *Polydactylus approximans*, and the sea bonito, *Gymnosarda pelamis*. The threadfin is common about Mazatlan, but had never been taken in the limits of the United States. It was once described as *Polynemus californiensis* by Thominot, from "California"; but that California which stretches from Rogue River to Cape San Lucas is zoölogically very indefinite, comprising three distinct marine faunas. The oceanic bonito is common at Honolulu and in Japan, and was once before noticed by Eigenmann at San Diego.

In the *Scientific American* for December 21 Mr. C. F. Holder publishes a photograph of *Luvarus imperialis*, a large and rare fish of the Mediterranean, lately taken at Avalon on Santa Catalina Island, off the coast of California. There is no question as to the identity of the species with the genus Luvarus, and no specific difference appears in Mr. Holder's photograph, a copy of which the writer has seen.

Mr. Holder also reports that he has seen two specimens of the oarfish, *Regalecus* (*russelli?*), taken in Avalon Bay. One of these, two feet long, was examined by him while alive. "Its topknot," Mr. Holder says, "was a vivid or scarlet mass of plumes. The dorsal spines, which merged into a long dorsal fin, extended to the tail. The color of the body was a brilliant silver sheen, splashed with equally vivid black zebra-like stripes." Mr. Holder was unable to obtain either specimen, the finders insisting on placing them on a piece of board to be dried in the sun as "curios." In this condition the water soon evaporated, and practically nothing was left.

In *Science* for Dec. 13, 1901, Gill and Townsend give an account of a large fish about five feet in length, dredged by the *Albatross* at a depth of 1050 fathoms off the Chonos Archipelago in Chile. By some accident the huge specimen was cast overboard, and the description is made from a photograph. The fish is of trachinoid affinities and is perhaps one of the Percophidæ. The name given it is *Macrias amissus*. The recent explorations of Dollo show that

in the deep seas of the Antarctic, as well as the shore waters, trachinoid fishes related to Percophis and Notothenia are numerous and characteristic.

In the *Proceedings of the New England Zoölogical Club*, Mr. Samuel Garman shows that the Japanese deep-water Chimæra described by Professor Mitsikuri as *Harriotta pacifica* is the type of a new and still more primitive genus, which he calls Rhinochimæra. It differs from Harriotta by the possession of teeth like the horny covers of the jaws on tortoises and birds, without the separate tritors found in Chimæra, Harriotta, and Callorhynchus. Garman divides the group into three families, Chimæridæ, Callorhynchidæ, and Rhinochimæridæ, the latter including Harriotta. Garman makes the important discovery that the frontal holder or cartilaginous hook on the forehead of the male is present on the adult of Harriotta and Rhinochimæra as well as on Chimæra and Callorhynchus. As with the ventral claspers, this is developed only when the animal is sexually mature. Its presence is therefore a distinctive character of all the living Chimæra-like fishes, and it is found in no other fishes. Mr. Garman's paper, though brief and not illustrated, is a most valuable addition to our knowledge of these fishes.

Under the head of "The Smallest Known Vertebrate," Dr. H. M. Smith gives in *Science* for Jan. 3, 1902, an account of a diminutive goby only fifteen millimeters long when adult, found in Lake Buki in southern Luzon, where, from its great numbers, it is an article of food of considerable importance. It is named *Mistichthys luzonius*. The genus is very close to the Japanese Eutæniichthys, also very diminutive, but it has larger and rougher scales than the latter.

In the *Bulletin of the Museum of Paris* for 1901, Dr. Pellegrin notes a collection of fishes obtained by M. Diguet in the Lake of Chapala and in Rio Lerma in Mexico. Most of the species have been already noted by Jordan and Snyder. One new species, *Xenendum multipunctatum*, is described from the pond called Agua Azul, near Guadalajara. I cannot agree with Dr. Pellegrin that *Ameiurus dugesi* of Lake Chapala is the same as *Ameiurus catus*, nor that the little *Gambusia infans* is the same as *G. affinis*.

Under the head of "Les Poissons Vénéneux," Dr. Jacques Pellegrin of the Museum at Paris publishes a valuable account of the fishes of which the flesh is known or suspected to be poisonous. It appears that in Tetraodon, Spheroides, Tropidichthys, Balistes, Monacanthus, and other genera — mostly globefishes, filefishes, and

trigger fishes — a poisonous alkaloid is developed which causes a very dangerous disease known in Cuba as ciguatera. This poison attacks the nervous system, and through it other organs, often producing death. Similar alkaloids of less virulence exist in sharks and some other fishes. Dr. Pellegrin regards it as a kind of device for the preservation of the species by the destruction of its enemies with the death of the individual. The virulence of the poison is less in fresh waters and grows less away from the tropics.

Similar effects are sometimes produced by the flesh of species otherwise innocuous which have been themselves poisoned by poisonous mollusks, polyps, or fish.

Illness caused by decayed fish flesh or by undigested fish has no relation to ciguatera. This Pellegrin calls "ichthyosisme," and it may be produced by various species under conditions adverse to assimilation.

In a monthly publication called *Japan and America*, for January, 1902, Dr. Jordan gives an account of the Salmonidæ of Japan, this paper being an epitome of one sent to Japan for publication. The valid species known in Japanese waters are the Sake (*Oncorhynchus keta*), the Ginmasu (*Oncorhynchus kisutch*), the Yesomasu (*Oncorhynchus masou* or *O. yessoënsis*, accidentally omitted in this paper), the Benimasu (*Oncorhynchus nerka*), the Yamabe or Kawamasu (*Salmo perryi*), the Ito (*Hucho blackistoni*), the Iwana (*Salvelinus pluvius*), the Malma (*Salvelinus malma*), the Amemasu (*Salvelinus kundscha*), and the famous Ayu, one of the finest food fishes in all the world (*Plecoglossus altivelis*). This dwarf salmon of the rivers should by all means be introduced into the clear streams of Maine, Quebec, and California. Few finer food fishes exist anywhere. D. S. J.

Vascular System of Bdellostoma dombeyi. — C. M. Jackson[1] has made the vascular system of *Bdellostoma dombeyi* the subject of investigation. The author emphasizes the interest and importance attaching to the Cyclostomata owing to their being the lowest of the Craniata and possessing many structural features which must be regarded as ancestral. The blood-vascular system is described in detail, and certain points concerning its comparative anatomy are discussed.

The heart is a simple tubular organ, situated in a pericardial chamber which retains free communication with the peritoneal

[1] Jackson, C. M. An Investigation of the Vascular System of Bdellostoma dombeyi, *Journ. of the Cin. Soc. of Nat. Hist.*, vol. xx, No. 1, pp. 13–48. 3 pls.